

### Subject Description Form

<b>Subject Code</b>	AAE5105
<b>Subject Title</b>	Fleet Management and Aviation Sustainability
<b>Credit Value</b>	3
<b>Level</b>	5
<b>Pre-requisite/ Co-requisite/ Exclusion</b>	Nil
<b>Objectives</b>	<p>This subject will provide students with</p> <ol style="list-style-type: none"> <li>1. advanced airline fleet management, crew pairing and fatigue management; and</li> <li>2. the advanced engines types, aviation fuel, emission mitigation strategy, sustainable aviation system in airline aspect.</li> </ol>
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> <li>a. design and develop mathematical modelling in resolving airline fleet, crew pairing and aircraft routing problem;</li> <li>b. design and develop proper airline resource planning in profitable manner;</li> <li>c. evaluate the impact of aviation emission and its mitigation strategy; and</li> <li>d. determine airline solution contributing to the societal, economic and global environment factors.</li> </ol>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p><b>Operations management, fleet and crew management and flight route management:</b> Airline fleet management, crew management, aircraft routing and sustainability; Aircraft model configuration and serviceability; Air route planning and schedule recovery; Aircraft life cycle and associated legislation; Risk management in airline operation; Human resource management: crew pairing and rostering management.</p> <p><b>Sustainable aviation:</b> Carbon budgets for aviation; Environmental technology and the future of flight; Aviation and the EU emissions trading system; Airport noise control and modelling; Environmental impact of aviation emission; Sustainable aviation system.</p> <p><b>Airline strategic planning:</b> Coalition, competition, integration and substitution; Pricing strategies; Business models of full-service carriers and low-cost carriers; Competition of airline and high-speed rail.</p>

<b>Teaching/Learning Methodology</b>	<p>Teaching is conducted through lectures and assignments. The basic knowledge, research methodology and theoretical models will be introduced.</p> <p>The understanding of how to address and formulate problems by using mathematical programming, data analytics, and operations research techniques is emphasised. Research methodologies, such as data analytics and mathematical modelling skills, are taught in class as well as the related real-life scenarios using data to enhance their research abilities.</p>																																							
	Teaching/Learning Methodology		Outcomes																																					
			a	b	c	d																																		
	Lecture		√	√	√	√																																		
<b>Assessment Methods in Alignment with Intended Learning Outcomes</b>	<table><tr><th rowspan="2">Specific assessment methods/tasks</th><th rowspan="2">% weighting</th><th colspan="4">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th></tr><tr><th>a</th><th>b</th><th>c</th><th>d</th></tr><tr><td>1. Assignment</td><td>20%</td><td>√</td><td>√</td><td></td><td></td></tr><tr><td>2. Mid-term examination</td><td>30%</td><td></td><td>√</td><td>√</td><td>√</td></tr><tr><td>3. Final examination</td><td>50%</td><td></td><td>√</td><td>√</td><td>√</td></tr><tr><td>Total</td><td>100%</td><td colspan="4"></td></tr></table> <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Overall Assessment:</p> <p>0.5 × Continuous Assessment + 0.5 × Final Examination</p> <p>The continuous assessment (50%) is aimed at enhancing the students’ comprehension and assimilation of various topics of the syllabus via assignment and mid-term examination. The final examination (50%) will also be considered to assess the students learning outcome.</p>						Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				a	b	c	d	1. Assignment	20%	√	√			2. Mid-term examination	30%		√	√	√	3. Final examination	50%		√	√	√	Total	100%				
Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)																																						
		a	b	c	d																																			
1. Assignment	20%	√	√																																					
2. Mid-term examination	30%		√	√	√																																			
3. Final examination	50%		√	√	√																																			
Total	100%																																							
<b>Student Study Effort Expected</b>	Class contact:																																							
	▪ Lecture					39 Hrs.																																		
	Other student study effort:																																							
	▪ Self-study / preparation					66 Hrs.																																		
	Total student study effort					105 Hrs.																																		

<b>Reading List and References</b>	<ol style="list-style-type: none"> <li>1. Abdelghany, A., &amp; Abdelghany, K. (2016). Modeling applications in the airline industry. Routledge.</li> <li>2. Bazargan, M. (2016). Airline operations and scheduling. Routledge.</li> <li>3. Bridger, R. (2013). Plane truth: Aviation's real impact on people and the environment.</li> <li>4. Budd, L., Griggs, S., &amp; Howarth, D. (2013). Sustainable aviation futures. Emerald Group Publishing.</li> <li>5. Clark, P. (2017). Buying the big jets: fleet planning for airlines. Taylor &amp; Francis.</li> <li>6. Walker, T., &amp; Bergantino, A. S. (2020). Sustainable Aviation. Palgrave Macmillan.</li> <li>7. Wu, C.-L. (2016). Airline operations and delay management: insights from airline economics, networks and strategic schedule planning: Routledge.</li> </ol>
------------------------------------	--

July 2023